US009132936B2

(12) **United States Patent**
Kohler

(10) **Patent No.: US 9,132,936 B2**
(45) **Date of Patent: Sep. 15, 2015**

(54) **CARTON WITH TRAY**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 190 days.

(21) Appl. No.: **13/783,539**

(22) Filed: **Mar. 4, 2013**

(65) **Prior Publication Data**

US 2013/0256392 A1 Oct. 3, 2013

Related U.S. Application Data

(60) Provisional application No. 61/686,046, filed on Mar. 29, 2012.

(51) **Int. Cl.**

B65D 5/72	(2006.01)
B65D 71/36	(2006.01)
B31B 1/86	(2006.01)
B65B 5/02	(2006.01)
B65B 43/00	(2006.01)

(52) **U.S. Cl.**

CPC ... ***B65D 5/72*** (2013.01); ***B31B 1/86*** (2013.01); ***B65B 5/024*** (2013.01); ***B65B 43/00*** (2013.01); ***B65D 71/36*** (2013.01); *B65D 2571/0066* (2013.01); *B65D 2571/00141* (2013.01); *B65D 2571/00401* (2013.01); *B65D 2571/00506* (2013.01); *B65D 2571/00567* (2013.01); *B65D 2571/00728* (2013.01)

(58) **Field of Classification Search**

USPC 229/117.13, 117.16, 117.17, 120.32

See application file for complete search history.

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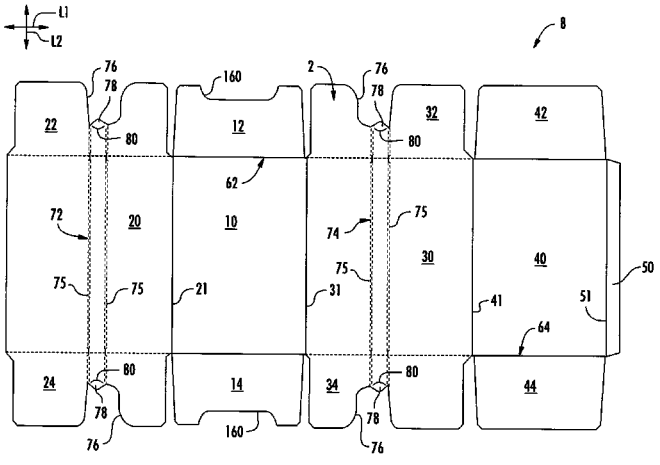
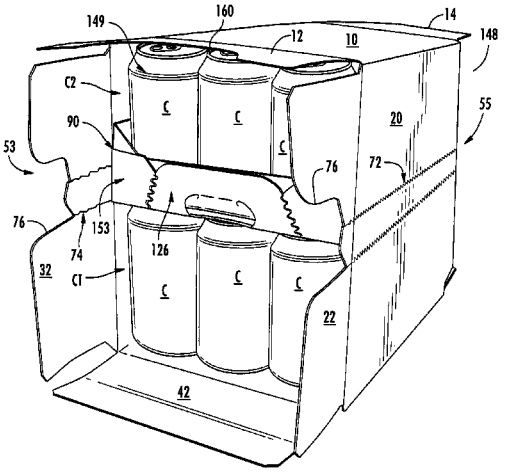
(57) **ABSTRACT**

A carton for containing a plurality of articles arranged in at least a first layer and a second layer above the first layer. The carton comprises a plurality of panels that extends at least partially around an interior of the carton and an opening feature for accessing the articles in the carton. The opening feature extends in at least one panel of the plurality of panels. A tray is disposed at least partially in the interior of the carton. At least a portion of the tray can be positioned between the first layer and the second layer. The tray can be for supporting the articles in the second layer to allow removal of the articles in the second layer after activation of the opening feature of the carton.

48 Claims, 8 Drawing Sheets





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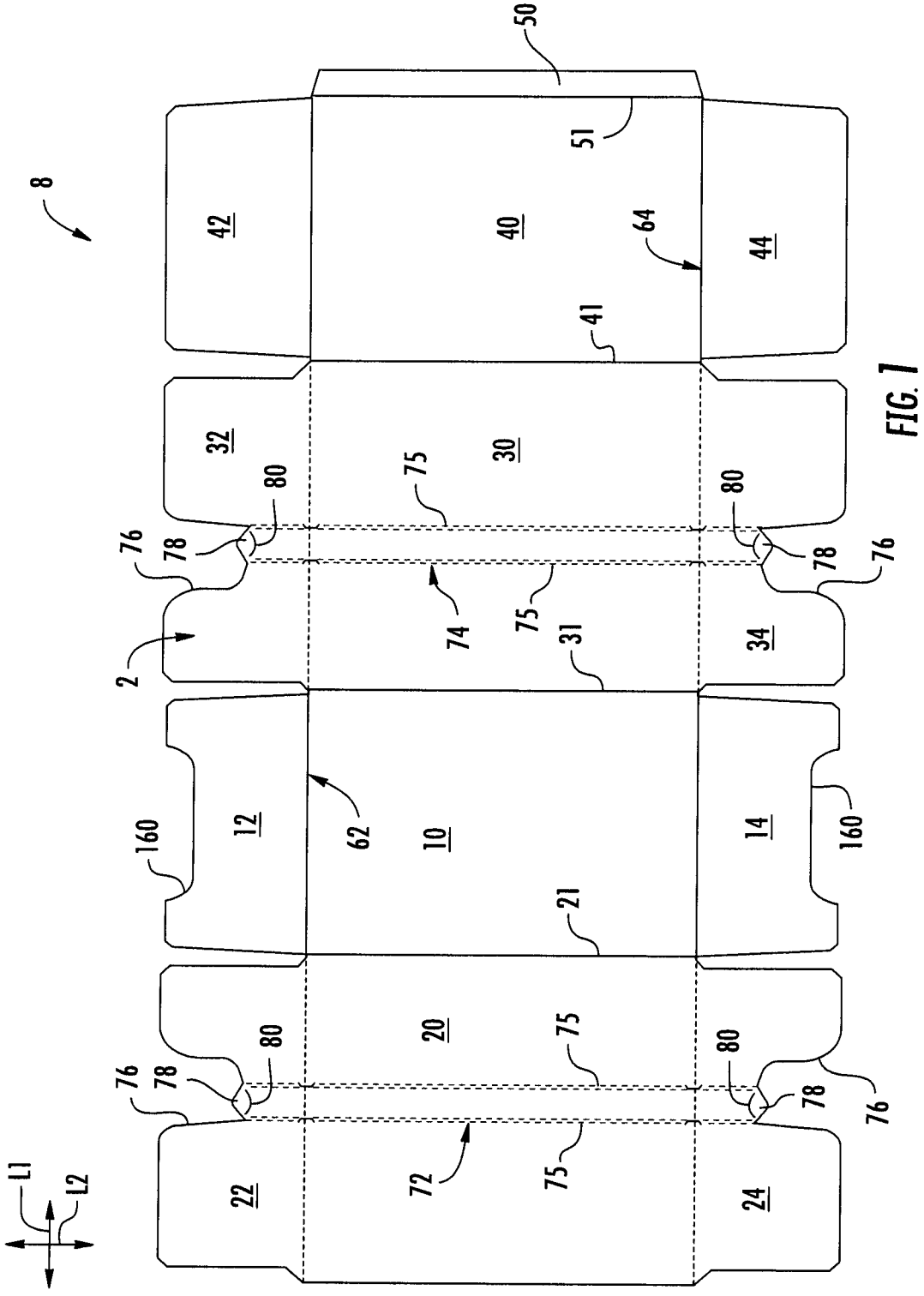
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34
160
12
62
10
14
160
21
20
75
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80
76
78
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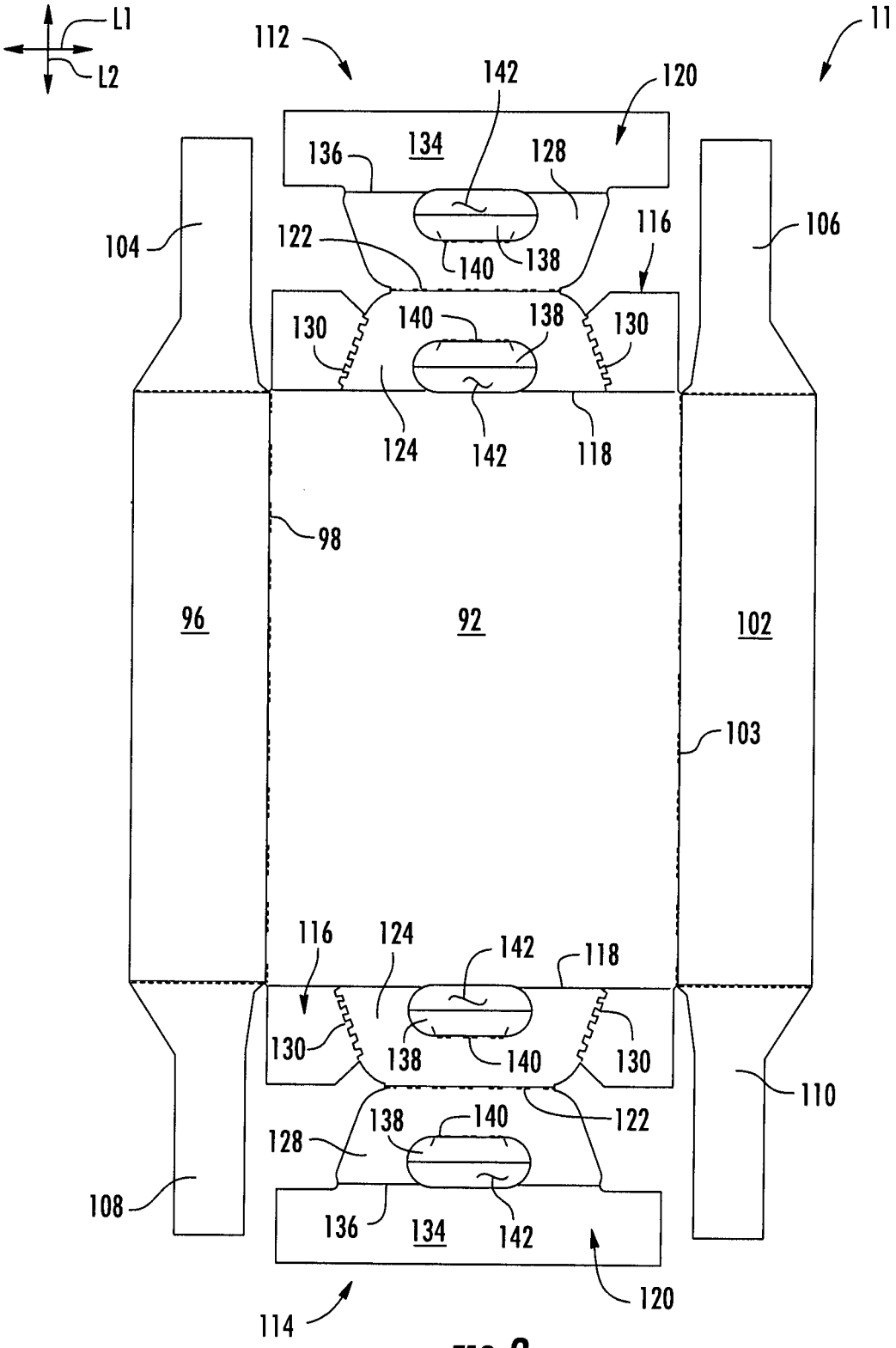
76
72
75
22
24
L1
L2

FIG. 1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L2
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98
96
92
102
103
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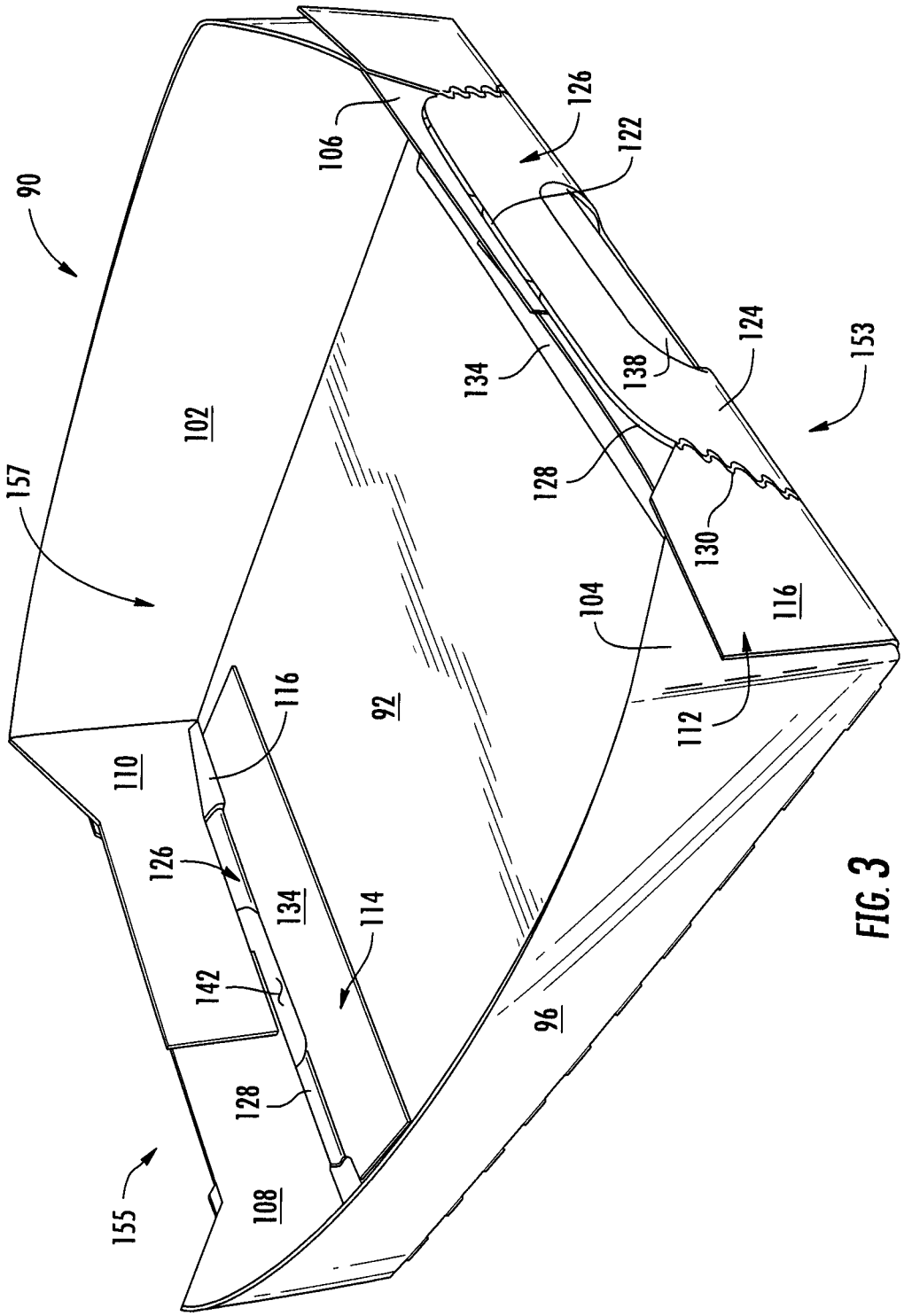
FIG. 2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102
157
106
126
122
134
138
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153
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104
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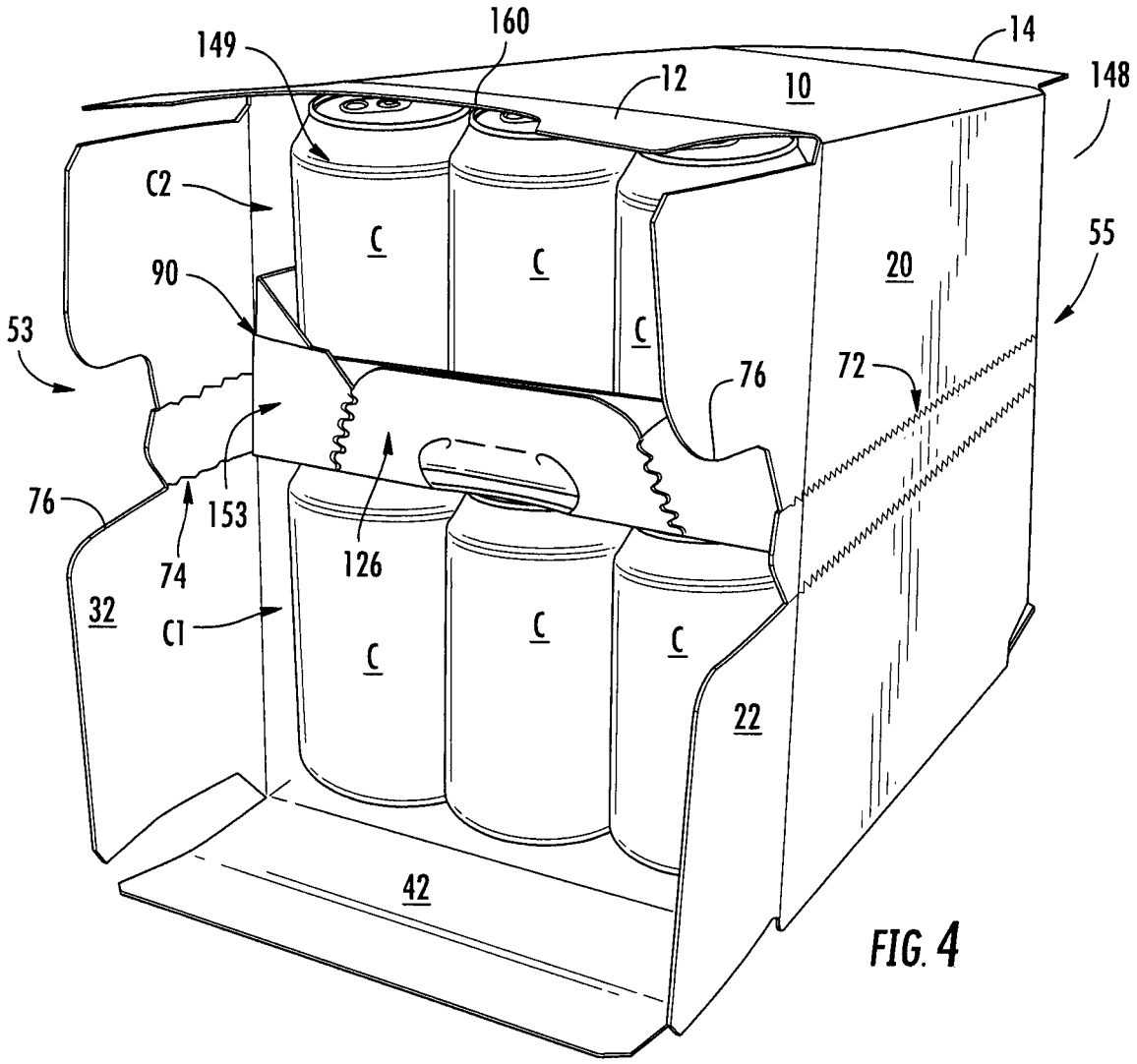
114
142
128
108
155
96

FIG. 3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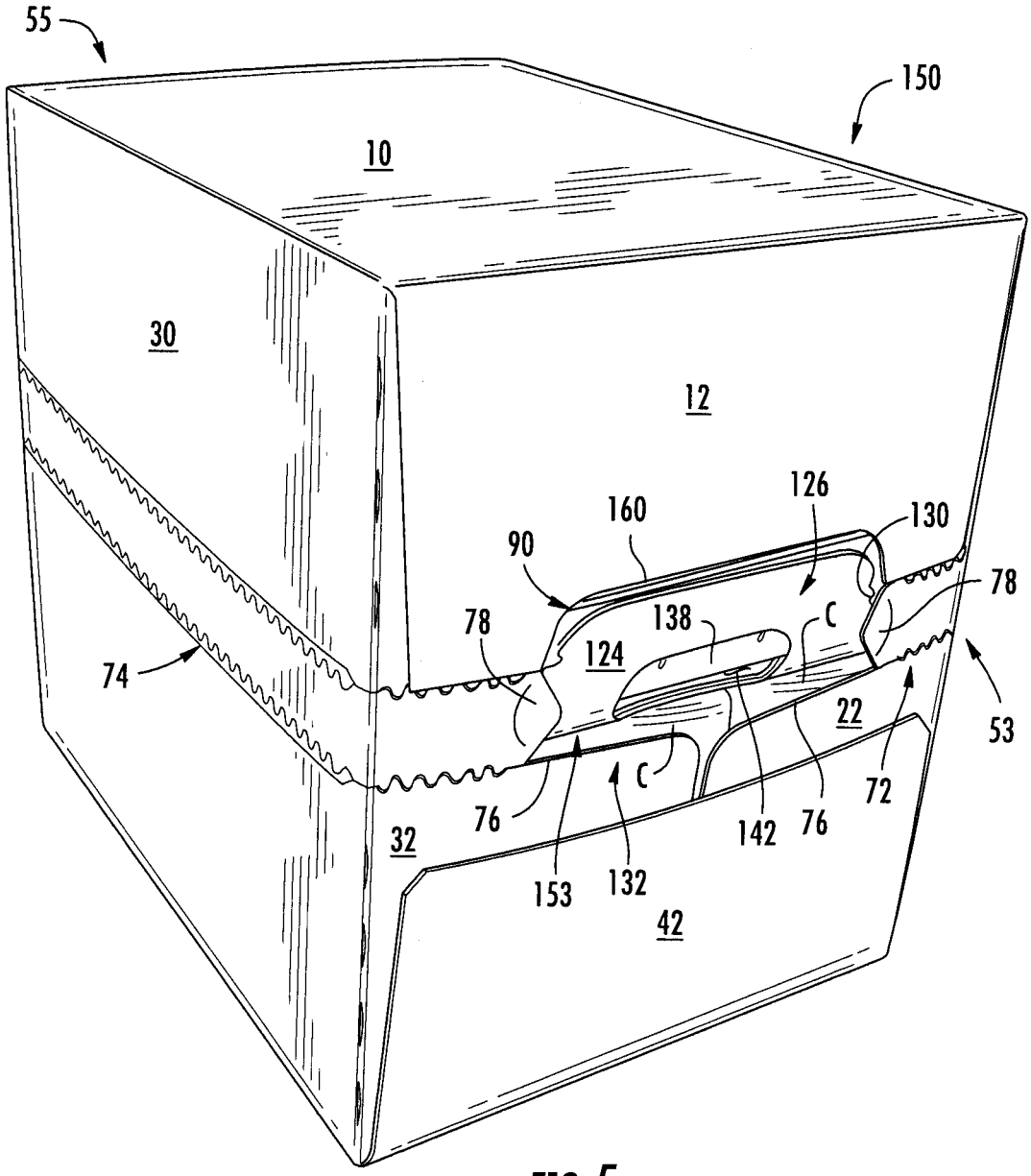
160
14
12
10
148
C2
C
C
C
55
20
90
53
76
72
76
153
74
126
32
C1
C
C
C
22
42

FIG. 4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12
126
160
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72
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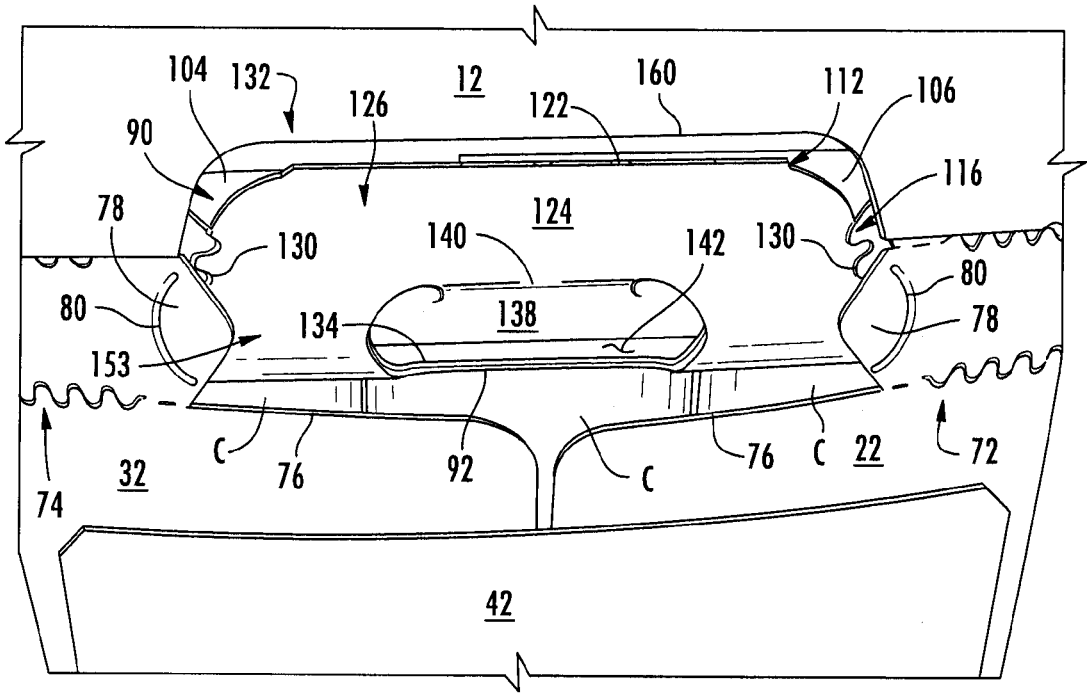
32
153
132
42

FIG. 5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C
76
C
22
72
74
32
42

FIG. 6A

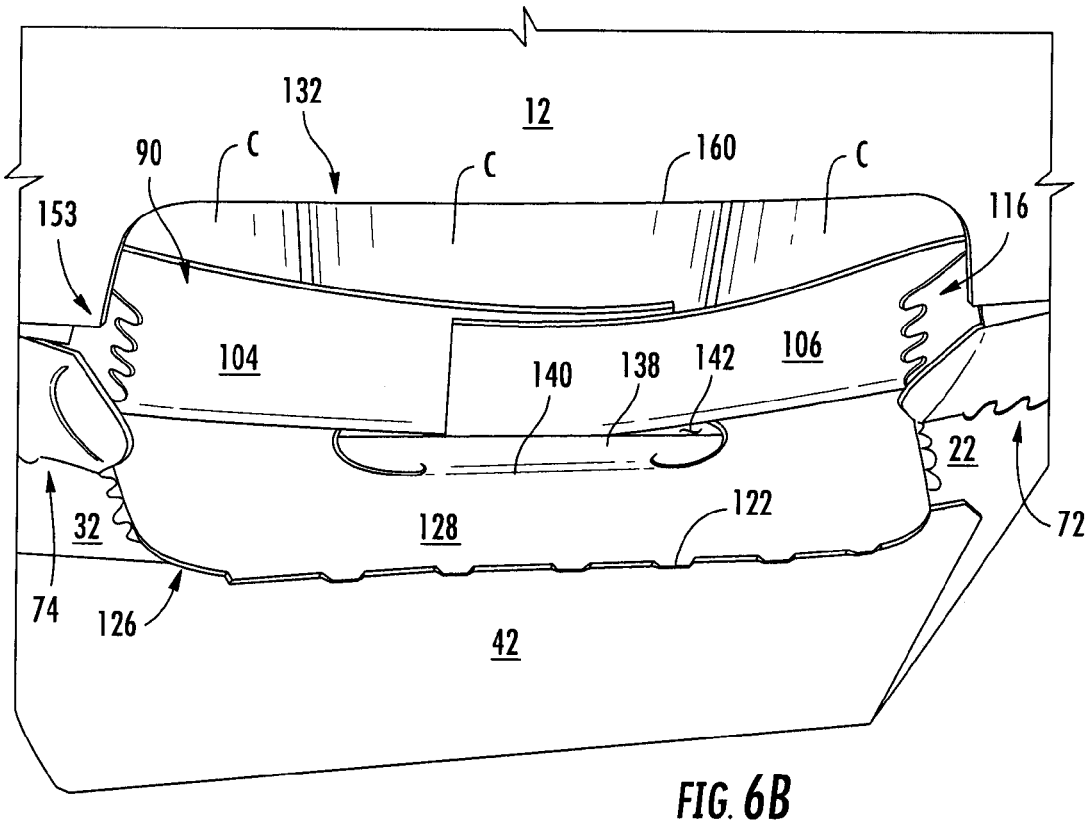
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FIG. 6B

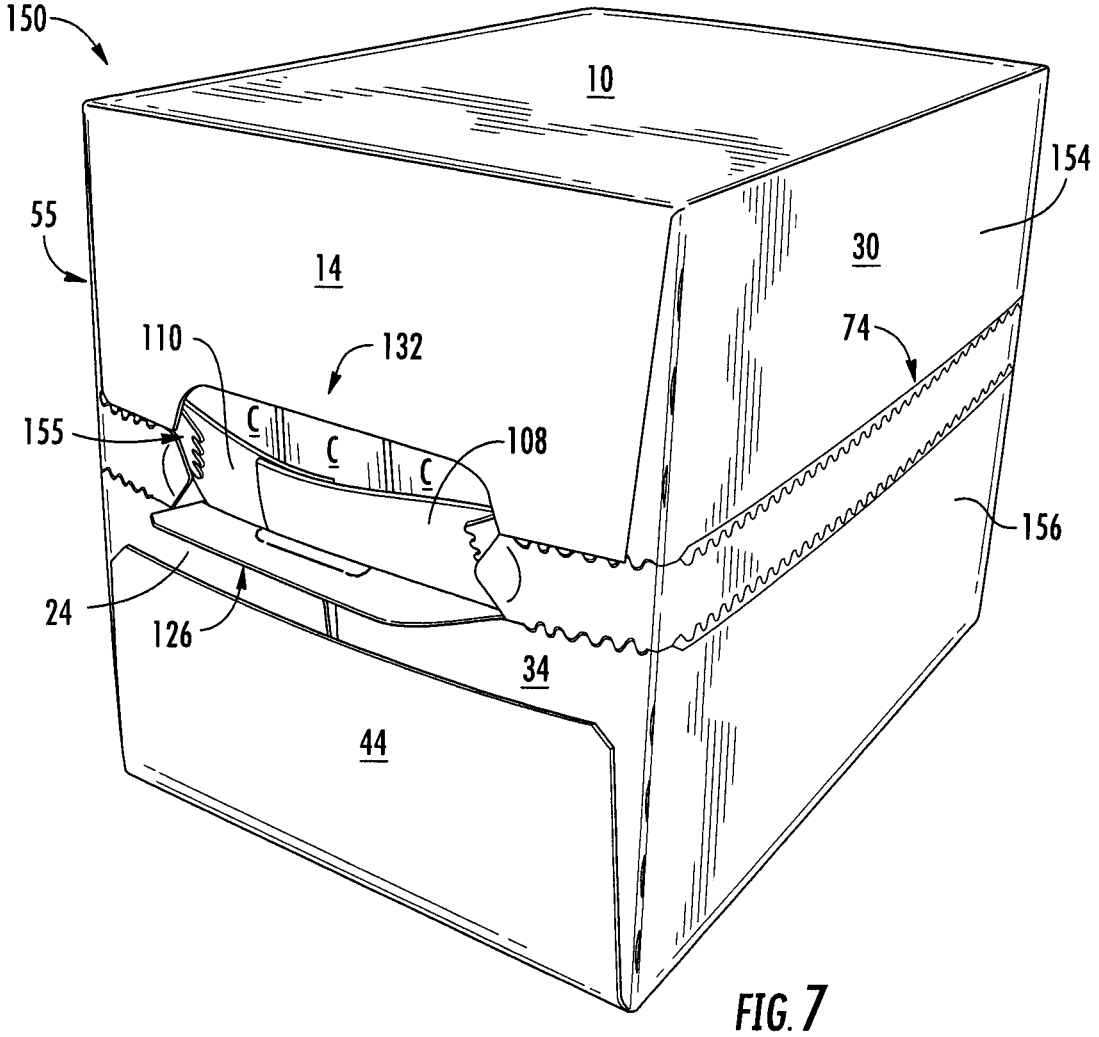

FIG. 7

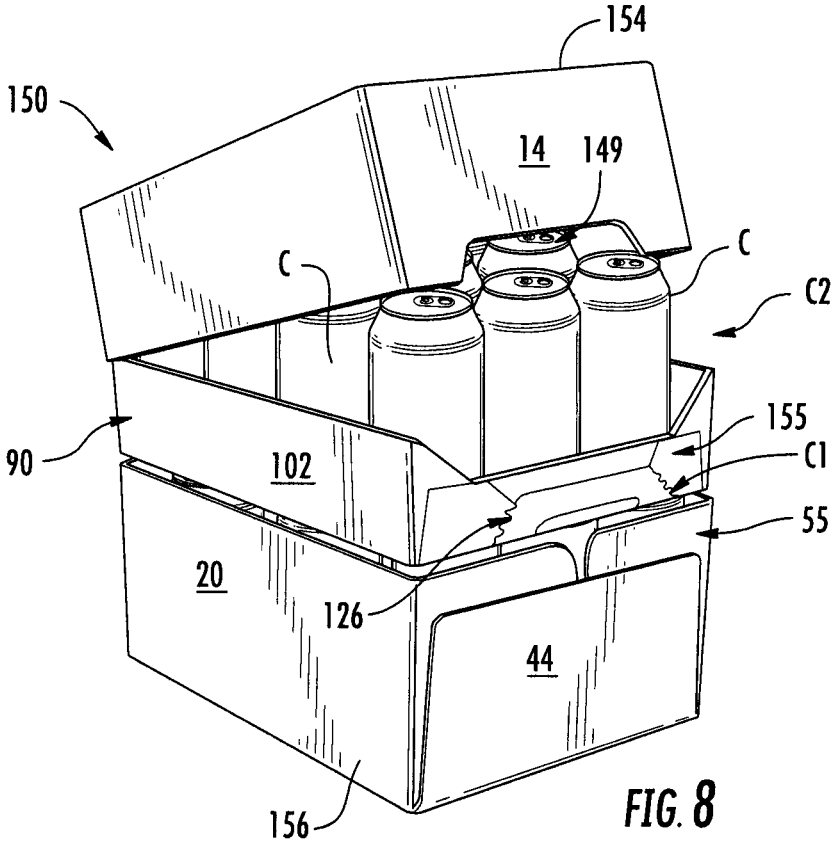
154
150
14
149
C
C
C2
155
90
102
C1
55
20
126
44
156

FIG. 8

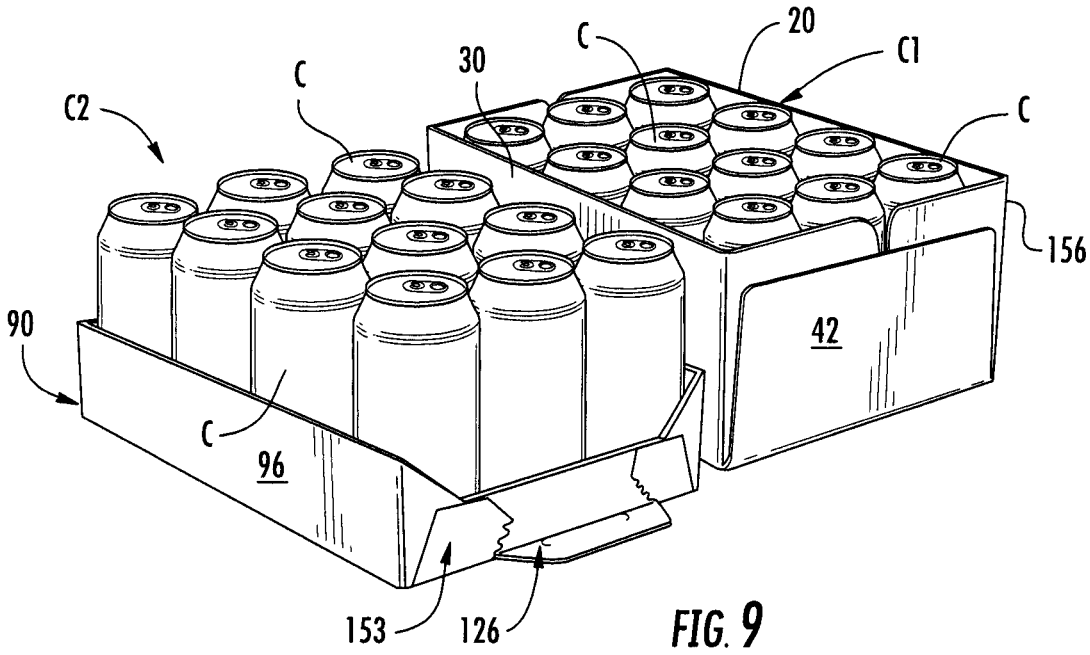
20
C
C1
30
C
C2
C
156
90
42
C
96
153
126

FIG. 9

CARTON WITH TRAY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Patent Application No. 61/686,046, filed Mar. 29, 2012.

INCORPORATION BY REFERENCE

The disclosures of U.S. Provisional Patent Application No. 61/686,046, which was filed on Mar. 29, 2012, and U.S. Pat. No. 7,717,321, which was issued May 18, 2010, are incorporated by reference as if presented herein in their entirety, for all purposes.

BACKGROUND OF THE DISCLOSURE

The present disclosure generally relates to cartons for holding and dispensing containers or other types of articles. More specifically, the present disclosure relates to cartons with a tray to separate at least two layers of articles and to support the top layer of the articles.

SUMMARY OF THE DISCLOSURE

In general, one aspect of the disclosure is directed to a carton for containing a plurality of articles arranged in at least a first layer and a second layer above the first layer. The carton comprises a plurality of panels that extends at least partially around an interior of the carton and an opening feature for accessing the articles in the carton. The opening feature extends in at least one panel of the plurality of panels. A tray is disposed at least partially in the interior of the carton. At least a portion of the tray can be positioned between the first layer and the second layer. The tray can be for supporting the articles in the second layer to allow removal of the articles in the second layer after activation of the opening feature of the carton.

In another aspect, the disclosure is generally directed to, in combination, a carton blank and a tray blank for forming a carton for containing a plurality of articles arranged in at least a first layer and a second layer above the first layer. The carton blank comprises a plurality of panels for at least partially extending around an interior of the carton formed from the blank and an opening feature extending in at least one panel of the plurality of panels. The tray blank comprises at least a main panel for at least partially forming a tray disposed at least partially in the interior of the carton formed from the carton blank. At least a portion of the main panel is for being positioning between the first layer and the second layer. When the carton is formed, the tray is for supporting the articles in the second layer to allow removal of the articles in the second layer after activation of the opening feature of the carton formed from the carton blank.

In another aspect, the disclosure is generally directed to a method of forming a carton. The method comprises obtaining a carton blank and a tray blank. The carton blank comprises a plurality of panels and an opening feature extending in at least one panel of the plurality of panels, and the tray blank comprises at least a main panel. The method further comprises forming an interior of the carton at least partially defined by the plurality of panels, the forming the interior of the carton comprising forming an open-ended sleeve. The method also can comprise forming a tray from the tray blank and arranging a plurality of containers in at least a first layer and a second layer so that at least a portion of the main panel of the tray is disposed between the first layer and the second layer. The method further can comprise inserting the plurality of containers and the tray at least partially into the interior of the carton. The tray can support the articles in the second layer to allow removal of the articles in the second layer after activation of the opening feature of the carton.

In another aspect, the disclosure is generally directed to a method of opening a carton. The method comprises obtaining a carton comprising a plurality of panels that extends at least partially around an interior of the carton, an opening feature extending in at least one panel of the plurality of panels, and a tray disposed at least partially in the interior of the carton. The carton contains a plurality of articles arranged in at least a first layer and a second layer above the first layer, and at least a portion of the tray is disposed between the first layer and the second layer. The tray can at least partially contain the articles in the second layer. The method also can comprise at least partially opening the carton by actuating the opening feature to form an upper portion and a lower portion of the carton and at least partially removing the upper portion. The method further can comprise removing the tray and the second layer of articles from the lower portion of the carton.

In another aspect, the disclosure is generally directed to a method of forming a handle in a carton. The method comprises obtaining a carton comprising a plurality of panels that extends at least partially around an interior of the carton, an opening feature extending in at least one panel of the plurality of panels, and obtaining a tray disposed at least partially in the interior of the carton, the tray comprising a main panel and a handle foldably connected to the main panel. The carton can contain a plurality of articles arranged in at least a first layer and a second layer above the first layer, and at least a portion of the main panel can be disposed between the first layer and the second layer. The method further can comprise grasping the handle of the tray and folding the handle out from the interior of the carton.

In another aspect, the disclosure is generally directed to a package comprising a carton containing a plurality of articles arranged in at least a first layer and a second layer above the first layer. The carton comprises a plurality of panels that extends at least partially around an interior of the carton and an opening feature for accessing the articles in the carton. The opening feature can extend in at least one panel of the plurality of panels. The package further comprises a tray at least partially disposed in the carton. At least a portion of the tray is positioned between the first layer and the second layer. The tray can support the articles in the second layer when removing the articles in the second layer after activation of the opening feature of the carton.

In another aspect, the disclosure is generally directed to a tray for being at least partially positioned between at least a first layer of containers and a second layer of containers. The tray comprises a main panel and an end flap foldably connected to the main panel. The end flap comprises a first portion and a second portion foldably connected to the first portion. The tray can further comprise a handle comprising a first handle panel in the first portion of the end flap and a second handle panel in the second portion of the end flap. The first handle panel can be foldably connected to the second handle panel, and the second handle panel can at least partially overlap the first handle panel. The first handle panel is at least partially defined by a tear line extending in the first portion of the end flap.

Those skilled in the art will appreciate the above stated advantages and other advantages and benefits of various addi-

tional embodiments reading the following detailed description of the embodiments with reference to the below-listed drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

According to common practice, the various features of the drawings discussed below are not necessarily drawn to scale. Dimensions of various features and elements in the drawings may be expanded or reduced to more clearly illustrate the embodiments of the disclosure.

FIG. **1** is a plan view of a carton blank used to form a carton according to an exemplary embodiment of the disclosure.

FIG. **2** is a plan view of a tray blank used to form a tray in the carton according to the exemplary embodiment of the disclosure.

FIG. **3** is a perspective view showing the assembled tray according to the exemplary embodiment of the disclosure.

FIG. **4** is a perspective view showing the tray and a partially-erected carton according to the exemplary embodiment of the disclosure.

FIG. **5** is a perspective view showing the assembled carton and tray according to the exemplary embodiment of the disclosure.

FIGS. **6**A and **6**B are perspective views of an end of the carton of FIG. **5** showing a handle of the tray according to the exemplary embodiment of the disclosure.

FIG. **7** is a perspective view of the carton of FIG. **5** with the activated handle of FIG. **6**B according to the exemplary embodiment of the disclosure.

FIG. **8** is a perspective view showing the partially opened carton according to the exemplary embodiment of the disclosure.

FIG. **9** is a perspective view showing a lower portion of the carton and the removed tray according to the exemplary embodiment of the disclosure.

Corresponding parts are designated by corresponding reference numbers throughout the drawings.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

The present disclosure generally relates to cartons including packages including a carton housing a plurality of articles and a divider positioned between layers of the articles. Cartons of the present disclosure can contain articles that can be, for example, beverage or food containers. The articles can also include soup cans or other food or beverage containers such as, for example, bottles, cans, PET containers, or other containers. The articles can be made from materials suitable in composition for packaging the particular food or beverage item, and the materials include, but are not limited to, glass; aluminum and/or other metals; plastics such as PET, LDPE, LLDPE, HDPE, PP, PS, PVC, EVOH, and Nylon; paperboard, composite paperboard and plastic; and the like, or any combination thereof.

Cartons according to the present disclosure can accommodate articles of any shape. For the purpose of illustration and not for the purpose of limiting the scope of the disclosure, the following detailed description describes beverage containers (e.g., aluminum cans or glass bottles) as disposed within the carton embodiments. In this specification, the terms "inner," "outer," "lower," "bottom," "upper," and "top" indicate orientations determined in relation to fully erected and upright cartons.

FIG. **1** is a plan view of an exterior surface **2** of a carton blank **8** used to form a carton **150** (FIG. **5**) according to an exemplary embodiment of the disclosure. The carton **150** can be used to house a plurality of articles such as containers C (FIG. **4**) typically arranged in at least two layers in the carton. The layers of containers C are separated by a tray, generally indicated at **90** (FIG. **3**) formed from a tray blank, generally indicated at **11** (FIG. **2**). Accordingly, in one embodiment, the tray **90** forms a divider in the carton **150**. In the illustrated embodiment, the containers C are arranged in a lower layer C**1** and an upper layer C**2** (FIG. **4**) with each of the lower and upper layers C**1**, C**2** comprising twelve containers arranged in three rows, four containers per row. This arrangement is generally referred to as a 3×4×2 arrangement. It is understood that the containers C may be arranged in more than two layers and that each layer may have more or less than twelve containers without departing from the scope of this disclosure. As will be discussed in more detail herein, in one embodiment, the tray **90** supports the upper layer C**2** of containers C and can be removed from the carton **150** after activation of opening features of the carton.

The carton blank **8** has a longitudinal axis L**1** and a lateral axis L**2**. In the illustrated embodiment, the carton blank **8** comprises a top panel **10** foldably connected to a first side panel **20** at a first transverse fold line **21**, a first side panel **30** foldably connected to the top panel **10** at a second transverse fold line **31**, and a bottom panel **40** foldably connected to the second side panel **30** at a third transverse fold line **41**. An adhesive flap **50** can be foldably connected to the bottom panel **40** at a fourth transverse fold line **51**.

The top panel **10** is foldably connected to a first top end flap **12** and a second top end flap **14**. The first side panel **20** is foldably connected to a first side end flap **22** and a second side end flap **24**. The second side panel **30** is foldably connected to a first side end flap **32** and a second side end flap **34**. The bottom panel **40** is foldably connected to a first bottom end flap **42** and a second bottom end flap **44**. When the carton **150** is erected, the end flaps **12**, **22**, **32**, and **42** close a first end **53** of the carton **150**, and the end flaps **14**, **24**, **34**, and **44** close a second end **55** of the carton **150**. In accordance with an alternative embodiment of the present disclosure, different flap arrangements can be used for closing the ends of the carton.

The end flaps **12**, **22**, **32**, and **42** may extend along a first marginal area of the carton blank **8**, and may be foldably connected at a first longitudinal fold line **62** that extends along the length of the carton blank **8**. The end flaps **14**, **24**, **34**, and **44** may extend along a second marginal area of the carton blank **8**, and may be foldably connected at a second longitudinal fold line **64** that also extends along the length of the carton blank **8**. The longitudinal fold lines **62**, **64** may be, for example, substantially straight, or offset at one or more locations to account for blank thickness or for other factors.

The carton blank **8** has opening features that include a first tear strip **72** extending in the lateral direction L**2** from an edge of the blank at the side end flap **22**, across the first side panel **20**, and across the second side end flap **24** to an edge of the blank. The opening features of the carton blank **8** include a second tear strip **74** extending in the lateral direction L**2** from an edge of the blank at the side end flap **32**, across the second side panel **30**, and across the second side end flap **34** to an edge of the blank. In one embodiment, each of the tear strips **72**, **74** is at least partially defined by two spaced, generally parallel tear lines **75** extending generally in the lateral direction L**2**. In the illustrated embodiment, the side end flaps **22**, **24**, **32**, **34** have a respective notch **76** at a corresponding edge of the blank where the tear strip **72**, **74** is located. The tear strips **72**, **74** can include one or more opening tabs **78** extending adjacent one or more of the notches **76**. As shown in FIG.

1, the opening tabs **78** are foldably connected to the tear strips **72**, **74** along respective curved scores **80** so that a user can easily grasp one or more opening tabs **78** and initiate tearing of the tear strips **72**, **74** from one or both ends **53**, **55** of the erected carton **150**. The side end flaps **22**, **24**, **32**, **34** and/or the tear strips **72**, **74** could be otherwise shaped, arranged, and/or configured without departing from the disclosure.

As shown in FIG. **2**, the tray blank **11** used to form the tray **90** of the illustrated embodiment has a longitudinal axis L**1** and a lateral axis L**2**. As illustrated in FIG. **2**, the L**1** direction will be referred to as the longitudinal direction and the L**2** direction will be referred to as the transverse or lateral direction for the tray blank **11** in order to comport with the convention established for the carton blank **8** (FIG. **1**). Accordingly, a longitudinal line in the erected tray **90** will be generally aligned with and/or parallel to a longitudinal line (e.g., the longitudinal fold line **62**) in the carton **150** when the tray **90** is disposed in the erected carton (FIG. **5**). The tray blank **11** has a main panel **92** for positioning between the layers C**1**, C**2** of containers C when the containers are loaded into the carton **150** (FIG. **4**). The main panel **92** may be sized to generally correspond with the size of the top panel **10** and bottom panel **40** of the carton blank **8**. The tray blank **11** includes a first side panel **96**, foldably connected to the main panel **92** along a lateral fold line **98** and a second side panel **102** foldably connected to the main panel at a lateral fold line **103**. Each of the side panels **96**, **102** includes respective first reinforcing end flaps **104**, **106** and respective second reinforcing end flaps **108**, **110**.

In the illustrated embodiment, the tray blank **11** includes a first end flap **112** and a second end flap **114**. As shown in FIG. **2**, each of the end flaps **112**, **114** comprises a first portion **116** foldably connected to the main panel **92** at a respective lateral fold line **118** and a second portion **120** foldably connected to the first portion at a respective lateral fold line **122**. In the illustrated embodiment, the end flaps **112**, **114** are identical; however, either or both of the end flaps could be alternatively shaped, arranged, and/or configured, or omitted, without departing from the disclosure. When the tray **90** is erected, the reinforcing end flaps **104**, **106** and the end flap **112** at least partially form a first end wall **153** of the tray **90**, and the reinforcing end flaps **108**, **110** and the end flap **114** at least partially form a second end wall **155** of the tray **90** (FIG. **3**). The side panels **96**, **102**, the reinforcing end flaps **104**, **106**, **108**, **110**, and the end flaps **112**, **114** could be otherwise shaped, arranged, and/or configured without departing from the disclosure. One or more of the side panels **96**, **102**, the reinforcing end flaps **104**, **106**, **108**, **110**, and the end flaps **112**, **114** could be omitted without departing from the disclosure.

As shown in FIG. **2**, each of the end flaps **112**, **114** can include features for forming a handle **126** (FIG. **3**) at a respective end of the tray **90** formed from the tray blank. In the illustrated embodiment, the handle features in each of the end flaps **112**, **114** include a first handle panel **124** foldably connected to a second handle panel **128** along the respective lateral fold line **122**. In one embodiment, each of the first handle panels **124** is foldably connected to the main panel **92** along the respective lateral fold line **118** and is partially defined by respective tear lines **130** extending obliquely in the respective first portions **116** of the end flaps **112**, **114**. In each of the second portions **120** of the respective end flaps **112**, **114**, the second handle panels **128** can be foldably connected to a respective attachment flap **134** along a respective lateral fold line **136**. In the illustrated embodiment, the handle features include a handle flap **138** foldably connected to each of the handle panels **124**, **128** along a respective lateral fold line **140** adjacent a respective handle opening **142**. The features for forming the handles **126** could be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

In one embodiment, the tray **90** is formed from the tray blank **11** by upwardly folding the side panels **96**, **102** and the first portions **116** of the end flaps **112**, **114** relative to the main panel **92**. As shown in FIG. **3**, for each of the end flaps **112**, **114**, the second portions **120** of the end flaps **112**, **114** can be folded along the respective lateral fold lines **122** so that the handle panels **124**, **128** are in face-to-face contact and the attachment flap **134** is in face-to-face contact with the main panel **92**. The attachment flaps **134** can be glued to the main panel **92** and/or the handle panels **124** can be glued to the respective handle panels **128**.

In the illustrated embodiment, the reinforcing end flaps **104**, **106**, **108**, **110** are folded relative to the side panels **96**, **102** and adhered to the first portions **116** of the respective end flaps **112**, **114**. In one embodiment, the reinforcing end flaps **104**, **106**, **108**, **110** are glued to the portions of the first portions **116** that are outside the tear lines **130** and are not glued to the handle panels **124**, **128**. Additionally, the reinforcing end flaps **104**, **108** can at least partially overlap the respective reinforcing end flaps **106**, **110** (FIGS. **3** and **6**B), and the overlapping portions can be glued together. As shown in FIG. **3**, the handle panels **128** at each end is in face-to-face contact with an interior surface of the respective handle panel **124** and an exterior surface of the reinforcing end flaps **104**, **106** or **108**, **110**. In one embodiment, the reinforcing end flaps **104**, **106** and the end flap **112** form a first end wall **153** of the tray **90**, the reinforcing end flaps **108**, **110** and the end flap **114** form a second end wall **155** of the tray **90**, and the four sides of the tray **90** are formed by the upwardly folded side panels **96**, **102** and end walls **153**, **155** extending around an interior **157** of the tray (FIG. **3**).

In one embodiment, the carton **150** may be erected from the carton blank **8** by first gluing or otherwise adhering the adhesive flap **50** to the inner side of the side panel **20** so that the top panel **10**, the first side panel **20**, the second side panel **30**, and the bottom panel **40** may be opened or set up to form a generally tubular, open-ended sleeve **148** having an interior **149** (FIG. **4**). The tray **90** and/or the open-ended sleeve **148** could be formed by other folding, positioning, and/or gluing steps without departing from the disclosure.

As shown in FIG. **4**, the containers C can be configured in a stacked arrangement with a first (lower) layer of containers C**1** and a second (upper) layer of containers C**2** located above the first layer of containers C**1**. The tray **90** can be positioned between the two layers of containers prior to placing the containers in the open-ended sleeve **148**. In one embodiment, the second (upper) layer of containers C**2** is placed on the main panel **92** of the tray **90** and the containers are supported by the side panels **96**, **102** and end walls **153**, **155**, and the main panel **92** can act as a divider separating the first and second layers of containers C**1**, C**2**.

The containers C arranged in the two layers C**1**, C**2** with the tray **90** therebetween can be loaded into the interior **149** of the partially erected carton or sleeve **148** (FIG. **4**), and the ends **53**, **55** can be closed. The generally tubular sleeve may be closed, for example, by folding and adhering the end flaps **12**, **22**, **32**, **42** at one end **53** of the carton **150**, and by folding and adhering the end flaps **14**, **24**, **34**, **44** at the other end **55** of the carton. As shown in FIGS. **5** and **6**A, the notches **76** in the side end flaps **22**, **32** are aligned with a notch **160** in the top end flap **12** so that an opening **132** is formed in the first closed end **53**. Similarly, as shown in FIG. **7**, the notches **76** in the side end flaps **24**, **34** are aligned with a notch **160** in the top end

flap **114** to form an opening **132** in the closed end **55**. Containers C or other articles and/or the tray **90**, for example, may be loaded into the sleeve at any time before one or both ends **53**, **55** of the carton **150** are closed by the end flaps **12**, **22**, **32**, **42**, **14**, **24**, **34**, **44**. The carton **150** could be formed by other folding, positioning, and/or gluing steps without departing from the disclosure.

As shown in FIGS. **6**A and **6**B, the handles **126** of the tray **90** can be activated at each closed end **53**, **55** of the carton **150** through the openings **132**. In one embodiment, one or both of the handles **126** can be grasped at the respective handle openings **142** and pulled outwardly through the openings **132** from the interior **149** of the carton **150**. Accordingly, in each of the handles **126**, the first handle panel **124** can tear away from the first portion **116** along the tear lines **130**, and the handle panels **124**, **128** can pivot outwardly with respect to the main panel **92** along the respective lateral fold line **118**. The carton **150** and tray **90** with an activated handle **126** is shown in FIG. **7**. In one embodiment, lifting the tray **90** by the handles **126** while in the closed carton **150** will lift the tray **90**, the carton **150**, and the containers C in both layers C**1**, C**2** since the tray is enclosed by the carton. The carton **150** and/or tray **90** could be otherwise carried without departing from the disclosure.

As shown in FIGS. **8** and **9**, the carton **150** can be opened by activating the opening features or tear strips **72**, **74** to separate the carton **150** into an upper portion **154** and a lower portion **156** (FIGS. **7** and **8**). Removal of the upper portion **154** of the carton **150** provides access to the containers C in the upper layer C**2** that are located in the tray **90**. In one embodiment, the tear strips **72**, **74** are generally aligned with the side panels **96**, **102** of the tray **90** so that the tray is at least partially exposed when the top portion **154** and the tear strips **72**, **74** are removed. The tray **90** with the upper layer of containers C**2**, can be lifted and carried at the handles **126** to remove the tray **90** and the upper layer of containers C**2** from the lower portion **156** of the carton **150** (FIG. **9**). In one embodiment, half of the containers C are located in the upper layer C**2** that can be carried by the tray **90** and half of the containers C are located in the lower layer C**1** that can be carried by the lower portion **156** of the carton **150**. Additionally, removing the tray **90** with the upper layer of containers C**2** provides access to the containers C in the lower layer C**1** in the lower portion **156**. Alternatively, the containers C and/or the tray **90** could be otherwise removed from the carton **150**.

In the illustrated embodiment, the carton **150** has three components for holding and carrying the containers C in the form of the upper portion **154**, the lower portion **156** that is removably attached to the upper portion **154** by the tear features **72**, **74**, and the tray **90**. The carton **150** could have other features or the features shown could be otherwise shaped, arranged, and/or configured without departing from the disclosure. For example, while the containers C are depicted in the figures as cans, the carton **150** and the tray **90** can be configured to contain any suitable beverage container or other article.

The present disclosure can be used in cartons that include various features, including additional opening features that provide easy access to the articles, and tilt features that position the articles at the front or rear end of the carton.

In general, the blanks of the present disclosure may be constructed from paperboard having a caliper so that it is heavier and more rigid than ordinary paper. The blank can also be constructed of other materials, such as cardboard, or any other material having properties suitable for enabling the carton to function at least generally, as described above. The blank can be coated with, for example, a clay coating. The clay coating may then be printed over with product, advertising, and other information or images. The blanks may then be coated with a varnish to protect information printed on the blanks. The blanks may also be coated with, for example, a moisture barrier layer, on either or both sides of the blanks. The blanks can also be laminated to or coated with one or more sheet-like materials at selected panels or panel sections.

As an example, a tear line can include: a slit that extends partially into the material along the desired line of weakness, and/or a series of spaced apart slits that extend partially into and/or completely through the material along the desired line of weakness, or various combinations of these features. As a more specific example, one type tear line is in the form of a series of spaced apart slits that extend completely through the material, with adjacent slits being spaced apart slightly so that a nick (e.g., a small somewhat bridging-like piece of the material) is defined between the adjacent slits for typically temporarily connecting the material across the tear line. The nicks are broken during tearing along the tear line. The nicks typically are a relatively small percentage of the tear line, and alternatively the nicks can be omitted from or torn in a tear line such that the tear line is a continuous cut line. That is, it is within the scope of the present disclosure for each of the tear lines to be replaced with a continuous slit, or the like. For example, a cut line can be a continuous slit or could be wider than a slit without departing from the present disclosure.

In accordance with the exemplary embodiments, a fold line can be any substantially linear, although not necessarily straight, form of weakening that facilitates folding there along. More specifically, but not for the purpose of narrowing the scope of the present disclosure, fold lines include: a score line, such as lines formed with a blunt scoring knife, or the like, which creates a crushed or depressed portion in the material along the desired line of weakness; a cut that extends partially into a material along the desired line of weakness, and/or a series of cuts that extend partially into and/or completely through the material along the desired line of weakness; and various combinations of these features. In situations where cutting is used to create a fold line, typically the cutting will not be overly extensive in a manner that might cause a reasonable user to incorrectly consider the fold line to be a tear line.

The above embodiments may be described as having one or more panels adhered together by glue during erection of the carton embodiments. The term "glue" is intended to encompass all manner of adhesives commonly used to secure carton panels in place.

The foregoing description of the disclosure illustrates and describes various embodiments. As various changes could be made in the above construction without departing from the scope of the disclosure, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. Furthermore, the scope of the present disclosure covers various modifications, combinations, alterations, etc., of the above-described embodiments. Additionally, the disclosure shows and describes only selected embodiments, but various other combinations, modifications, and environments are within the scope of the disclosure as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art. Furthermore, certain features and characteristics of each embodiment may be selectively interchanged and applied to other illustrated and non-illustrated embodiments of the disclosure.

What is claimed is:

1. A carton for containing a plurality of articles arranged in at least a first layer and a second layer above the first layer, the carton comprising:

a plurality of panels that extends at least partially around an interior of the carton, the plurality of panels comprises a side panel;

a plurality of end flaps respectively foldably connected to respective panels of the plurality of panels, the plurality of end flaps being overlapped with respect to one another to thereby at least partially form a closed end of the carton, the plurality of end flaps comprises a side end flap foldably connected to the side panel;

an opening feature for accessing the articles in the carton, the opening feature extending in at least the side end flap and the side panel; and

a tray disposed at least partially in the interior of the carton, at least a portion of the tray being for positioning between the first layer and the second layer, the tray being for supporting the articles in the second layer to allow removal of the articles in the second layer after activation of the opening feature of the carton.

2. The carton of claim 1, wherein the tray comprises a main panel and an end flap foldably connected to the main panel, the main panel is for being positioned between the at least two layers, and the end flap comprises a handle.

3. The carton of claim 2, wherein the handle is foldably connected to the main panel and comprises a handle opening.

4. The carton of claim 2, wherein the end flap comprises a first end flap portion and a second end flap portion, the first end flap portion comprising a first handle panel and the second end flap portion comprising a second handle panel, the first handle panel being foldably connected to the main panel and the second handle panel being foldably connected to the first handle panel.

5. The carton of claim 4, wherein the second end flap portion comprises an attachment flap foldably connected to the second handle panel, the second handle panel is at least partially in face-to-face contact with the first handle panel, and the attachment flap at least partially overlaps the main panel.

6. The carton of claim 5, wherein the first handle panel is at least partially defined by a tear line extending in the first end flap portion.

7. The carton of claim 5, wherein the tray further comprises a side panel foldably connected to the main panel and a reinforcing end flap foldably connected to the side panel, the reinforcing end flap being at least partially in face-to-face contact with at least a portion of the first end flap portion.

8. The carton of claim 7, wherein the reinforcing end flap is at least partially in face-to-face contact with the second handle panel.

9. The carton of claim 2, wherein:

the end flap of the tray is a first end flap and the handle is a first handle; and

the tray further comprises a second end flap foldably connected to the main panel, the second end flap comprising a second handle.

10. The carton of claim 9, wherein the tray further comprises a first side panel and a second side panel, each of the first side panel and the second side panel being respectively foldably connected to the main panel and comprising a respective first reinforcing end flap and a respective second reinforcing end flap, the first reinforcing end flaps being at least partially overlapped adjacent the first end flap and the second reinforcing end flaps being at least partially overlapped adjacent the second end flap.

11. The carton of claim 1, further comprising:

an opening extending in the closed end of the carton.

12. The carton of claim 11, wherein:

the opening comprises a notch in the side end flap; and

the opening feature comprises a tear strip extending in at least the side end flap and the side panel, the tear strip extending from the notch.

13. The carton of claim 12, wherein:

the side panel is a first side panel, the side end flap is a first side end flap, the notch is a first notch, and the tear strip is a first tear strip;

the plurality of panels comprises a second side panel;

the plurality of end flaps comprises a second side end flap foldably connected to the second side panel;

the opening comprises a second notch in the second side end flap; and

the opening feature comprises a second tear strip extending in at least the second side end flap and the second side panel, the second tear strip extending from the second notch.

14. The carton of claim 11, wherein the tray comprises a handle that is generally aligned with the opening.

15. The carton of claim 14, wherein:

the tray further comprises a main panel; and

the handle comprises a handle panel foldably connected to the main panel and a handle opening extending between the handle panel and the main panel.

16. In combination, a carton blank and a tray blank for forming a carton for containing a plurality of articles arranged in at least a first layer and a second layer above the first layer,

the carton blank comprising a plurality of panels for at least partially extending around an interior of the carton formed from the blank and an opening feature extending in at least one panel of the plurality of panels, and a plurality of end flaps respectively foldably connected to respective panels of the plurality of panels, the plurality of end flaps for being overlapped with respect to one another to thereby at least partially form a closed end of the carton formed from the carton blank; and

the tray blank comprising at least a main panel for at least partially forming a tray disposed at least partially in the interior of the carton formed from the carton blank, at least a portion of the main panel being for positioning between the first layer and the second layer, wherein when the carton is formed, the tray is for supporting the articles in the second layer to allow removal of the articles in the second layer after activation of the opening feature of the carton formed from the carton blank; and

features for forming an opening extending in the closed end of the carton formed from the carton blank.

17. The combination of claim 16, wherein the tray blank comprises an end flap foldably connected to the main panel, the main panel is for being positioned between the at least two layers, and the end flap comprises handle features for forming a handle in the tray formed from the tray blank.

18. The combination of claim 17, wherein the end flap comprises a first end flap portion and a second end flap portion, the first end flap portion comprising a first handle panel and the second end flap portion comprising a second handle panel, the first handle panel being foldably connected to the main panel and the second handle panel being foldably connected to the first handle panel.

19. The combination of claim 18, wherein the second end flap portion comprises an attachment flap foldably connected to the second handle panel, and the second handle panel is for being disposed at least partially in face-to-face contact with

the first handle panel and the attachment flap is for at least partially overlapping the main panel when the tray is formed from the tray blank.

20. The combination of claim **19**, wherein the first handle panel is at least partially defined by a tear line extending in the first end flap portion.

21. The combination of claim **19**, wherein the tray further comprises a side panel foldably connected to the main panel and a reinforcing end flap foldably connected to the side panel, the reinforcing end flap for being positioned at least partially in face-to-face contact with at least a portion of the first end flap portion when the tray is formed from the tray blank.

22. The combination of claim **21**, wherein the reinforcing end flap is for being disposed at least partially in face-to-face contact with the second handle panel when the tray is formed for the tray blank.

23. The combination of claim **17**, wherein:

the end flap of the tray blank is a first end flap and the handle features are first handle features for forming a first handle in the tray formed from the tray blank;

the tray blank further comprises a second end flap, a first side panel, and a second side panel, each of the second end flap, the first side panel, and the second side panel being respectively foldably connected to the main panel;

the second end flap comprises second handle features for forming a second handle in the tray formed from the tray blank;

each of the first side panel and the second side panel comprises a respective first reinforcing end flap and a respective second reinforcing end flap; and

the first reinforcing end flaps are for being at least partially overlapped adjacent the first end flap and the second reinforcing end flaps are for being at least partially overlapped adjacent the second end flap when the tray is formed from the tray blank.

24. The combination of claim **16**, wherein:

the plurality of panels comprises a side panel;

the plurality of end flaps comprises a side end flap foldably connected to the side panel;

the features for forming the opening comprise a notch in the side end flap; and

the opening feature comprises a tear strip extending in at least the side end flap and the side panel, the tear strip extending from the notch.

25. The combination of claim **24**, wherein:

the side panel is a first side panel, the side end flap is a first side end flap, the notch is a first notch, and the tear strip is a first tear strip;

the plurality of panels comprises a second side panel;

the plurality of end flaps comprises a second side end flap foldably connected to the second side panel;

the features for forming the opening comprise a second notch in the second side end flap; and

the opening feature comprises a second tear strip extending in at least the second side end flap and the second side panel, the second tear strip extending from the second notch.

26. The combination of claim **16**, wherein the tray blank comprises handle features for forming a handle that is for being generally aligned with the opening extending in the closed end of the carton formed from the carton blank.

27. The combination of claim **26**, wherein the handle features comprise a handle panel foldably connected to the main panel and a handle opening extending between the handle panel and the main panel.

28. A method of forming a carton, comprising:

obtaining a carton blank and a tray blank, the carton blank comprising a plurality of panels and a plurality of end flaps respectively foldably connected to respective panels of the plurality of panels, the plurality of panels comprises a side panel, the plurality of end flaps comprises a side end flap foldably connected to the side panel, and the carton blank further comprising an opening feature extending in at least the side end flap and the side panel, and the tray blank comprising at least a main panel;

forming an interior of the carton at least partially defined by the plurality of panels, the forming the interior of the carton comprising forming an open-ended sleeve;

forming a tray from the tray blank;

arranging a plurality of containers in at least a first layer and a second layer so that at least a portion of the main panel of the tray is disposed between the first layer and the second layer; and

inserting the plurality of containers and the tray at least partially into the interior of the carton, wherein the tray supports the articles in the second layer to allow removal of the articles in the second layer after activation of the opening feature of the carton.

29. The method of claim **28**, wherein the tray blank comprises an end flap foldably connected to the main panel, the main panel is for being positioned between the at least two layers, and the forming the tray further comprises forming a handle in the end flap.

30. The method of claim **29**, wherein the end flap comprises a first end flap portion and a second end flap portion, the first end flap portion comprising a first handle panel and the second end flap portion comprising a second handle panel, the first handle panel being foldably connected to the main panel and the second handle panel being foldably connected to the first handle panel, the forming the handle comprising folding the second handle panel to overlap the first handle panel.

31. The method of claim **30**, wherein the second end flap portion comprises an attachment flap foldably connected to the second handle panel, the forming the tray comprising positioning the attachment flap to at least partially overlap the main panel.

32. The method of claim **31**, wherein the tray further comprises a side panel foldably connected to the main panel and a reinforcing end flap foldably connected to the side panel, the forming the tray comprising positioning the reinforcing end flap to be at least partially in face-to-face contact with at least a portion of the first end flap portion.

33. The method of claim **28**, further comprising:

a plurality of end flaps respectively foldably connected to respective panels of the plurality of panels, the forming the carton comprising at least partially forming a closed end of the carton by overlapping the plurality of end flaps with respect to one another;

the at least partially forming the closed end comprises forming an opening extending in the closed end of the carton; and

the tray comprises a handle that is generally aligned with the opening.

34. A method of opening a carton, comprising:

obtaining a carton comprising a plurality of panels that extends at least partially around an interior of the carton, an opening feature extending in at least one panel of the plurality of panels, and a tray disposed at least partially in the interior of the carton, wherein the carton contains a plurality of articles arranged in at least a first layer and a second layer above the first layer, and at least a portion

of the tray is disposed between the first layer and the second layer, the tray at least partially containing the articles in the second layer, and the plurality of panels comprises a side panel, the carton further comprising a plurality of end flaps respectively foldably connected to respective panels of the plurality of panels, the plurality of end flaps being overlapped with respect to one another to thereby at least partially form a closed end of the carton, the plurality of end flaps comprises a side end flap foldably connected to the side panel;

at least partially opening the carton by actuating the opening feature extending in at least the side end flap and the side panel to at least partially separate an upper portion and a lower portion of the carton and at least partially removing the upper portion; and

removing the tray and the second layer of articles from the lower portion of the carton.

35. The method of claim **34**, wherein the tray comprises a main panel and an end flap foldably connected to the main panel, the main panel being disposed between the at least two layers, the end flap comprising a handle, and the removing the tray and the second layer of articles comprises grasping the handle to carry the tray.

36. The method of claim **34**, wherein:

the carton further comprises an opening extending in the closed end of the carton;

the opening feature comprises a tear strip extending in at least one panel of the plurality of panels and at least one end flap of the plurality of end flaps, the tear strip extending from the opening; and

the at least partially opening the carton comprising tearing the tear strip from the opening.

37. The method of claim **36**, wherein:

the opening comprises a notch in the side end flap; and

the tear strip extends in at least the side end flap and the side panel.

38. The method of claim **37**, wherein:

the side panel is a first side panel, the side end flap is a first side end flap, the notch is a first notch, and the tear strip is a first tear strip;

the plurality of panels comprises a second side panel;

the plurality of end flaps comprises a second side end flap foldably connected to the second side panel;

the opening comprises a second notch in the second side end flap;

the opening feature comprises a second tear strip extending in at least the second side end flap and the second side panel, the second tear strip extending from the second opening; and

the at least partially opening the carton comprising at least partially removing the first tear strip and the second tear strip by tearing the first tear strip and the second tear strip from the opening.

39. The method of claim **36**, wherein the tray comprises a handle that is generally aligned with the opening.

40. A method of forming a handle in a carton, comprising:

obtaining a carton comprising a plurality of panels that extends at least partially around an interior of the carton, an opening feature extending in at least one panel of the plurality of panels, and a tray disposed at least partially in the interior of the carton, the tray comprising a main panel and a handle foldably connected to the main panel, wherein the carton contains a plurality of articles arranged in at least a first layer and a second layer above the first layer, and at least a portion of the main panel is disposed between the first layer and the second layer;

grasping the handle of the tray;

folding the handle out from the interior of the carton;

actuating the opening feature to separate the carton into an upper portion and a lower portion;

at least partially removing the upper portion of the carton; and

carrying the tray and the second layer of the plurality of articles at handle of the tray and removing the tray and the second layer of the plurality of articles from the lower portion of the carton.

41. The method of claim **40**, wherein:

the carton further comprises a plurality of end flaps respectively foldably connected to respective panels of the plurality of panels, the plurality of end flaps being overlapped with respect to one another to thereby at least partially form a closed end of the carton, and an opening extending in the closed end of the carton;

the grasping the handle of the tray comprises reaching through the opening in the closed end of the carton; and

the folding the handle comprises folding at least a portion of the handle through the opening.

42. The method of claim **40**, wherein the tray comprises an end flap foldably connected to the main panel, at least a portion of the handle is connected to the end flap along a tear line, and the folding the handle comprises at least partially separating at least a portion of the handle from the end flap along the tear line.

43. The method of claim **40**, wherein the handle is a first handle and the tray comprises a second handle foldably connected to the main panel, the method further comprising grasping the second handle of the tray and folding the second handle out from the interior of the carton.

44. A package comprising:

a carton containing a plurality of articles arranged in at least a first layer and a second layer above the first layer, the carton comprising:

a plurality of panels that extends at least partially around an interior of the carton, the plurality of panels comprises a side panel;

a plurality of end flaps respectively foldably connected to respective panels of the plurality of panels, the plurality of end flaps being overlapped with respect to one another to thereby at least partially form a closed end of the carton, the plurality of end flaps comprises a side end flap foldably connected to the side panel; and

an opening feature for accessing the articles in the carton, the opening feature extending in at least the side end flap and the side panel; and

a tray at least partially disposed in the carton, wherein at least a portion of the tray is positioned between the first layer and the second layer, the tray supporting the articles in the second layer when removing the articles in the second layer after activation of the opening feature of the carton.

45. The package of claim **44**, further comprising:

an opening extending in the closed end of the carton.

46. The package of claim **45**, wherein:

the opening comprises a notch in the side end flap; and

the opening feature comprises a tear strip extending in at least the side end flap and the side panel, the tear strip extending from the notch.

47. The package of claim **45**, wherein the tray comprises a handle that is generally aligned with the opening.

48. The package of claim **47**, wherein:
the tray further comprises a main panel; and
the handle comprises a handle panel foldably connected to the main panel and a handle opening extending between the handle panel and the main panel.

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